UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Distr.
LIMITED
PPD.28
30 March 1987
Original: ENGLISH

INDUSTRIAL DEVELOPMENT STRATEGIES FOR FISHERY SYSTEMS IN DEVELOPING COUNTRIES: PRESENTATION OF THE MAIN RESULTS

Sectoral Studies Series
No.31

SECTORAL STUDIES BRANCH
STUDIES AND RESEARCH DIVISION

V.87-83577

Main results of the study work on industrial sectors are presented in the Sectoral Studies Series. In addition a series of Sectoral Working Papers is issued.

This document presents major results of work under the element Fisheries Industries in UNIDO's programme of Industrial Studies 1986/87.

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Preface

The Sectoral Studies Branch has undertaken a major study on development strategies for fisheries industrial systems in developing countries. This paper contains a short summary and the principal results of that study, mainly in the form of a set of tables.

In addition to this presentation of the principal results, further study documents include a main report as well as an additional volume describing the methodologies that were used. It is also planned to issue the underlying data base and a set of country case studies separately.

The study has been prepared in close co-operation with FAO.

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1. AIM AND PURPOSE OF THE STUDY

The importance of the contribution made by the fisheries sector to national economic, social and nutritional goals is now widely recognized and principles for a strategy and plan of action for fisheries management and development have been laid down. The objectives should be based on an assessment of the fishery resources available and the markets to be served, but othe· factors, including foreign operations, must also be considered. Most important, the fisheries sector should be viewed as a system in which different industrial, production, consumption and policy components interact. Thus development strategies should be comprehensive and should address multiple objectives.

These principles were recognized at the FAO World Conference on Fisheries Management and Development, held in Rome, July 1984. The present study, prepared by UNIDO in co-operation with FAO, concentrates on an assessment of the fisheries industrial system and its development possibilities in a large number of developing countries. Its main aim is to identify the necessary measures for enhancing the system in the form of government policies, technical assistance from UNIDO and other international organizations and investment requirements.

The major outputs of the study are:

- An assessment of the fisheries systems of 64 developing countries (including a comprehensive data base and 11 detailed country case studies).

- An outline of comprehensive development strategies for those countries, classified into 10 groups, each group having a specific pattern of present and potential development.

- Suggested pattern-specific actions for implementing the strategies and eliminating major problems and bottlenecks.

- A description of the required actions in terms of investment needs, needs for technical assistance, policies, support actions and mechanisms to be applied to the different components of the fisheries industrial system of the 10 groups of countries as well as options for co-operation between the countries.

Another main output of the study is the analysis of the structural components of a fisheries industrial system. This analysis led to a series of specific guidelines that should be considered by those involved in designing development strategies and programmes. These guidelines are presented in detail in chapter 6 of volume 1 of the study but are not further summarized here.

2. DEFINITION OF THE FISHERIES INDUSTRIAL SYSTEM (FIS)

This study concentrates on the industrial system related to the actual or potential exploitation of fish resources in developing countries. In order to make full use of these resources, a large number of industrial inputs are required, both for assisting in the catch and in the handling, processing, distribution and marketing phases. Through well defined support activities to

the industrial sector, UNIDO can make an important contribution to a better exploitation of this important resource for many developing countries. It is necessary, however, to utilize a systematic and comprehensive approach to programming and project development in the sector in order to avoid bottlenecks and suboptimal solutions.

The FIS can be defined as a system where all the industrial production and consumption components related to the fisheries activities in a given country, as well as the policies that affect them, interact in an integrated and interdependent manner.

The suggested approach requires a concrete description of the FIS. In this study the following nine components have been chosen as most appropriate to describe the system: resources (1), extraction/production (2), processing (3), distribution and marketing (4), consumption (5), industrial inputs (6), government policy (7), industrial organization (8), and the foreign sector (9).

A large number of data and information from country case studies and other available material, as well as information obtained from close co-operation with FAO, have been used for the analysis of the FIS components and their linkages in the 64 developing countries. For details of the analysis, please see "Industrial development strategies for fishery systems in developing countries", volume 1.

3. IDENTIFIED DEVELOPMENT PATTERNS

The analysis has yielded the identification of 10 country groups with distinctly different patterns of development with respect to their fisheries industrial system. The identified patterns are the following:

Group 1. The least favoured countries

Generally poor or least developed countries needing fish protein but lacking in skills, inputs or infrastructure to maximize resource use. Countries included: Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Sudan, Uganda, United Republic of Cameroon, United Republic of Tanzania, Zaire, Zambia, Bangladesh, Turkey.

Group 2. Largely state controlled fisheries

In these countries' fisheries the government is involved to a large degree. All of these countries have good potential for growth, both in marine and freshwater fisheries. Countries included: Angola, Morocco, Mozambique, Burma, People's Republic of China, Democratic Kampuchea, Viet Nam, Democratic Yemen, Mexico.

Group 3. Low priority fisheries

Fisheries are not a high priority in these countries due to resource limitations, predominance of national wealth in other sectors or other factors. Countries included: Gabon, Sierra Leone, Iran, Iraq, Saudi Arabia, Brazil, Colombia, Venezuela.

Group 4. Labour-intensive fisheries

These countries have large artisanal fishery sectors and big domestic markets. Most of them have well organized fisheries departments and all but two have flourishing inland or freshwater fisheries. Countries included: Algeria, Egypt, Tunisia, India, Indonesia, Pakistan, Sri Lanka.

Group 5. Small states with growth potential

These small population countries all have relatively good fishery potential, particularly for export. Their governments have made fisheries a high priority sector. Countries included: Congo, Oman, United Arab Emirates, Guyana, Fiji, Kiribati.

Group 6. Large but fluctuating resources and limited local demand for fish

These countries have large fish meal industries or export-oriented processing plants. Although their marine resources are substantial, they suffer from considerable natural fluctuations. Countries included: Namibia, Argentina, Chile, Ecuador, Panama (Ex. CZ), Peru, Uruguay.

Group 7. Laissez-faire fisheries

Commercial and private interests predominate in this group of countries which also have good domestic markets and labour intensive fisheries. They all have a high per capita consumption of fish. Countries included: Côte d'Ivoire, Area of Hong Kong, Republic of Korea, Malaysia, Philippines, Thailand.

Group 8. Lack of industrialization

Good fishery potential but with a serious lack of skills and inputs and with a very limited local market. Countries included: Mauritania, Somalia.

Group 9. Likely exporters

Similar to group 5 above, these countries are well poised to develop the export potential of their fisheries. They all have good traditional fishery skills. Countries included: Senegal, Maldives, Solomon Islands.

Group 10. Long distance, state-controlled

Strong government control but with somewhat better developed fisheries, particularly in deep sea operations. Countries included: Democratic People's Republic of Korea, Cuba.

4. SUMMARY OF RESULTS

4.1 Strategies and actions suggested for different country groups

For the fisheries industrial system of each of the country groups described in the previous section, the status, constraints, and factors that could enhance its development were assessed. Strategies and appropriate

actions have been suggested. These results are summarized in tables 1 to 10. For a full analysis please see "Industrial development strategies for fishery systems in developing countries", volume 1.

4.2 Investment and support action required

The results presented below are also summarized in table 11.

Priority actions

Investments. The most frequently required investments are in distribution and marketing components, followed by extraction, fisheries infrastructure and resource management, and then by processing. Investments in the promotion of trade, internal as well as export markets, are required to a lesser extent. The outstanding requirements for investment in the industrial inputs (extraction, processing and fisheries infrastructure) are for the construction of economical and appropriate vessels, investment in cold chain equipment and the implementation of improved fish transport systems. Harbours and ancilliary equipment and fish markets rate high among the fisheries infrastructure investment requirements. The new regime of the seas justifies the high frequency of investment needs for resource management. Among these the most frequent requirements are monitoring, aquaculture and survey followed by policing and conservation. Investment in aquaculture is justified, since aquaculture is one of the important options open to developing countries for increasing the production of fish.

In distribution and marketing, investments in improved fish transport systems are most needed, followed by cold chain and cold store facilities and the construction of harbours and markets. Within the fish transport systems the main activity to be encouraged is the standardization of fish containers and supplies of packing materials. This requires an investment in the manufacture of standard and refrigerated trucks. The high frequency of investment requirements found in distribution and marketing is due to very high losses of fish through spoilage because of lengthy handling and inadequate facilities found at this stage of the FIS in developing countries. The losses of fresh fish due to this reason have been estimated as 1.7 million tons or 10 per cent of all fresh fish caught. Improvements in marketing and distribution facilities and methods are also necessary for promoting fish consumption, especially in those countries where the levels of consumption are below 5 kg per capita per year and/or where the nutritional contribution of fish is very high (up to 40 per cent of the total animal protein consumption). Thus domestic trade-related priority actions are needed in groups 3, 6, 8 and 9. These actions should be accompanied by consumer education and institutional feeding programmes in the case of those countries where low levels of consumption prevail.

In extraction, the construction of vessels is the most frequent requirement which should be viewed together with the development of the local fleet and the availability of iceplants. In this sense the main activity is to integrate projects involving all village activities including fishermen/boat builders. The best investment would be to assist local boat builders and incorporate alternative materials in the construction of vessels. Local production of fishing gear and instrumentation applies only to groups 3, 6 and 7 where the general level of industrial development is relatively high. The activities linked with fishing gear and instrumentation

Table 1. Group 1: The least favoured countries (Bangladesh, Cameroon, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Sudan, Tanzania, Turkey, Uganda, Zaire, Zambia)

Strategies	Special problems	Relevant Constraint	Relevant Enhancement	Appropriate actions	Examples of ongoing actions
Increase production of fish for the domestic market.	Lack of infrastructure and facilities, inadequate capital inputs. Fishing vessels unable to exploit offshore waters.	10	11 12	Investment in harbours cold stores, fish processing plants, boatyards and marine engineering workshops.	Development bank loans for fishery harbours and infrastructure. Use of joint ventures to provide offshore fishing fleets and fish processing plants. Foreign investment in fish capture and processing companies. (Nigeria) Training of local personnel in foreign ships and factories. (Ghana)
Improve quality of fresh and cured fish and reduce waste from spoilage.	Lack of repair and maintenance facilities and services, to support industrial inputs.	14 21	6 3	Training of local technicians and mechanics.	
Extend distribution through better communications, transport and markets.	Distance of local fish markets from landing places. Inadequate roads, transports, storage.	13 26 7	6	Improvements to roads. Development of fish transport systems. Construction of hygienic fish markets with clean water supplies and ice.	Technical assistance from FAO. Financial aid for fish culture from UNDP and bilateral aid. (Bangladesh, Cameroon)
Introduce and develop aquaculture for both food fish and export species.	Lack of aquaculture inputs.	12	14	Investments in fish ponds and hatcheries and provision of extension services to fish farmers.	Rural development programmes with fisheries components. Technical assistance and advisory services from FAO Infopeche. (Nigeria)
Raise the skills and productivity of artisanal fishermen and fish curers.	Shortage of skilled personnel for offshore fisheries and for processing plants.	24		Technical training of personnel at three levels, basic, intermediate and advanced.	Use of field training centres, technical schools, apprenticeship schemes and fellowship programmes. (Zambia)
Exploit offshore fisheries for tuna, shrimp and small pelagics, particularly for export trade.	Fuel and energy costs and availability. High fuel consumption offshore fisheries. High energy consumption fish processing plants. Quality.	17 26	6	Introduction of fuel and energy conservation systems. Development of less energy expensive vessels and plants. Use of alternative fuels and energy sources where feasible. Personnel training in quality control and hygiene.	Introduction of smaller, less powerful offshore vessels for tuna and sardine. Insulation of fish holds and ice stores. Heat recovery in fish plants. Sail power for small boats, solar heating in fish meal and fish drying plants. (Various) Export quality control programme UNDP. (Bangladesh)
Establish and expand fisheries infrastructure, harbours, cold stores, ice plants, slipways, markets and retail depots.	Lack of spare parts for imported machineries.	11		Limitation and standardization of imported machineries, liberalization of import regulations. Establishing maintenance schedules and servicing routines before equipment is purchased.	Consultation and co-operation between bureaucracies in technical, purchasing and customs departments. Simplifying procedures. Insistence on training for personnel and service agreements with manufacturers before purchases are made. (Various)
Integrate small scale fisheries plans with rural development programmes.					

Table 2. Group 2: Largely state controlled fisheries
(Angola, Burma, China, Democratic Kampuchea, Mexico, Morocco, Mozambique, Viet Nam, Democratic Yemen)

Strategies	Special problems	Relevant Cons-traint	Relevant Enhan cement	Appropriate actions	Examples of ongoing actions
Develop offshore fishing Increase processing for both domestic and export trade.	General low level of technology in use on vessels and in post-harvest industries.	11 14 24	12	Technical assistance from agencies, bilateral aids, and/or joint venture partners. Investment in upgraded technologies.	Development of fish meal and fish canning industries with foreign partners. (Angola) Expansion of shrimp fishing fleet and export trade with joint venture companies. (China) Training of deep sea personnel and support industry officers in U.N. progammes. (Burma)
Support and expand role of artisanal fishermen.	Enormous distance or difficult terrain between fishing ports and population centres.	8,9	14	Fish curing or processing methods to produce longer shelf life for fish products. Improved transport containers for fish.	Encouragement and assistance to fish curers, traders and co-operatives to upgrade products and market further afield. Increasing demand in inland towns through consumer education and institutional feeding programmes (Mexico)
Develop new products from underutilized species.	Lack of manpower skills in vessel operation, fish processing, management and maintenance.	24 13	12	Use of U.N. and bilateral fellowship programmes.	Establishment of training centres, technical colleges and applied research centres for fisheries, with bilateral or U.N. assistance. (Democratic Yemen, Mozambique, Mexico)
Reduce dependence on imported vessels, machinery and equipment	Poor or varying processing standards and subsequent loss or wastage.	7		Training of personnel on foreign vessels or J.V. plants.	Basic infrastructure and quality control programmes for fish marketing. (Various)
Improve quality to raise value, particularly for export products.	Inadequate capital inputs or infrastructure.	11 13 24	12	Investment in clean water systems, hygienic premises and speedier handling systems. Vigorous and comprehensive training and hygienic practices and quality control.	Quality control service for shrimp export industry, with FAO support. (Mozambique) Large international fishery development plan, infrastructure and facilities. (Mexico) International credit to support fleet and plant expansion. (Various)
Promote distribution of fish and consumption by local population. Maintain or expand employment in the fishery sector.	Fishing fleet largely artisanal, inadequate number and type of offshore vessels.	13 7	6	Government funding for capital investments in fisheries. Use of development bank loan funds. Design and construction of locally appropriate new vessel types.	Diversification of offshore fleet and development new generation or more economical tuna seiners. (Mexico)
	Some major fish stocks offshore or in deep waters.		9 1	Use of joint venture fleets in the interim period.	Granting of fishing licenses to foreign fleets. Use of joint venture partners in capture and processing of shrimp. (Mozambique)

Table 3. Group 3: Low priority fisheries
(Brazil, Colombia, Gabon, Iran, Iraq, Saudi Arabia, Sierra Leone, Venezuela)

Strategies	Special problems	Relevant: Constraint	Relevant: Enhancement	Appropriate actions	Examples of ongoing actions
Improve the institutional framework governing fisheries.	Fisheries low priority in national economy.	2 21	1	Reassessment of national goals and priorities. This has already happened to an extent, fluctuating oil prices underlining the importance of domestic food production.	Examination and renewal of fisheries laws and regulations. Redesigning of institutional organization governing fisheries. Co-ordinating fisheries with development plans and policies. (Venezuela)
Increase domestic consumption of fish among all income groups.	General scarcity of skilled manpower for fisheries due to job opportunities elsewhere.	24 7		Development of the fishery sector efficiency and productivity to attract more skilled manpower.	Creation of anew fisheries corporation. Promotion of co operatives among artisanal fishermen. (Venezuela)
Expand fishing to all areas of the national EEZ and all major species.	Low demand for fish in domestic markets.	9		Better marketing and distribution coupled with consumer education programmes.	Improve marketing and distribution of fresh fish. Introduce fish in institutional feeding programmes. (Brazil)
Develop aquaculture, both coastal and inland.	Fishing industries generally under-capitalized.	19	14	Investment by both government and private sector, and creation of more attractive climate for fisheries investment.	Financial assistance to fisheries sector. Promotion of joint ventures in shipbuilding and manufacturing. Technical assistance agreements in fish and shrimp culture. (Venezuela)
Increase productivity and improve efficiency of both artisanal and commercial sectors of the industry.	Although fisheries exploitation is at a fairly low level, the overall resource is not large by global standards.	1	1	Wise use of existing resources. Possibly some joint ventures with non-oil producing countries, providing the fuel and capital for fishery exploitation in other country EEZ's.	Tuna fishing venture with non-petroleum country such as with the Saudi/Maldives joint venture companies. (Saudi Arabia)

Table 4. Group 4: Labour-intensive fisheries
(Algeria, Egypt, India, Indonesia, Pakistan, Sri Lanka, Tunisia)

Strategies	Special problems	Relevant Constraint	Relevant Enhancement	Appropriate actions	Examples of ongoing actions
Increase fish production to maintain food security and employment.	Some major fishing grounds located very far from markets and population centres.	7 13 15 16	1 9 3	Development of good quality processing and curing in rural areas, improvement of fish transport and establishment of regular schedules for fish collection boats or trucks.	Regional fisheries development programmes including harbours projects, provision of ice plants, cold stores and fish transport vessels, with finance from ADB. (Sri Lanka, Indonesia)
Improve marketing and distribution to raise consumption in inland areas.	Capture and processing technology inefficient or energy expensive in some areas.	3 4 5	6	Increased use of artisanal fishermen and intermediate technology vessels in offshore fisheries. Energy conservation and more efficient energy use in fish plants.	Fleet operation with artisanal tuna fishermen working around a mothership from a large domestic enterprise. (Indonesia) Use of natural energy and fuels such as biogas in fisheries. (India)
Decrease waste by reducing spoilage and by utilizing by-catch from shrimp trawlers.	Fishermen and fish plant operators lack knowledge of modern gear and techniques and of the operation, maintenance and repair of engines and machinery	24		Training of personnel at all levels but with strong emphasis on practical and technical aspects.	Establishment of training centres, academies, colleges and university departments for fisheries. Fisheries research projects on waste fish utilization. (Indonesia)
Increase exports by better quality processing and by harvesting offshore stocks of tuna and shrimp.	Appropriate technology for utilization of by-catch not yet ascertained.		6	Further research and pilot projects.	
Expand aquaculture both for food fish and for export species.	Fish canning plants lack continuity of supply.	27		Better marketing and distribution, more freezing and cold store facilities at distant ports. Purchase of frozen fish from abroad to maintain supplies in off seasons.	Joint venture agreements with foreign fleets and fish suppliers. (Egypt, Tunisia) Artisanal-private sector co-operation in capture and supply of fish. (Indonesia)
Develop support industries and general fisheries infrastructure	Artisanal fishermen lack capital and often operate at the mercy of markets and merchants.	21	6	Establishment of co-operatives, small scale credit schemes and support by extension services.	Ministry of co-operatives, fisheries projects K.I.K(small scale credit Indonesia) fisheries programmes. Fisheries extension service and co-operative establishment. (Indonesia)
	Fish farmers have difficulty getting legal access to land and water. Fish culture is mostly integrated with small scale agriculture or animal husbandry.		14	Integration of aquaculture with rural development programmes. Simplification of legal and administrative procedures. Support by extension services.	Fish pond development programme, S. Sumatra, S.F.D.P. ADB project. Bilateral and World Bank aid for brackish water ponds. (Indonesia)

Table 5. Group 5: Small states with growth potential
(Congo, Fiji, Guyana, Kiribati, Oman, United Arab Emirates)

Strategies	Special problems	Relevant Constraint	Relevant Enhancement	Appropriate actions	Examples of ongoing actions
Development of fish export industry, exploiting offshore waters.	Lack of large offshore fishing vessels and processing plants.	13 24	9,3,12	Use of joint venture agreements in the short term, while investments are made in fleets and plants, with assistance from development banks.	National fleet development while joint venture fishing enterprises continue at present. Training of local personnel on joint venture vessels. (Fiji)
Establishment of processes to prepare products from less exploited species and by-catch.	Insufficient knowledge of size and condition of fish stocks.	24	1,6	Resource survey possibly with FAO assistance. Fish stock assessment.	Research survey by national vessels. (Guyana) Short term surveys by U.N. research ships. (Oman, United Arab Emirates)
Incorporation of artisanal fishermen in industrial fisheries ventures.	General processing and quality standards inadequate for export trade.	4		Upgrading of infrastructure and procedures. Training of fish handling and processing personnel.	Investment in port handling facilities, markets, ice plants and cold stores. Training courses for fisheries staffs. (Guyana)
Reduction of waste losses and upgrading of product quality.	Need to maintain job opportunities in the fisheries sector.	24		Use of labour intensive technologies wherever possible. Selection of intermediate systems.	Credit and services for small scale fishermen Introduction of less energy expensive technologies. (Guyana)
Development of freshwater and marine aquaculture.	Difficulties in determining workable arrangements and processes for the economic utilization of by-catches and of deep water mesopelagic species.	7		Continued research and pilot projects on fish processing and marketing. Sharing of information and experience with other similar country fisheries.	Introduction of new technologies of producing surimi, fish sausage or fish protein concentrate. Marketing and consumer-testing programmes. (Guyana)

Table 6. Group 6: Large but fluctuating resources and limited local demand for fish (Argentina, Chile, Ecuador, Namibia, Panama, Peru, Uruguay)

Strategies	Special problems	Relevant: Constraint	Relevant: Enhancement	Appropriate actions	Examples of ongoing actions
Diversification of fisheries in capture technologies and species produced.	Fluctuating resource of anchovy and small pelagics.	27 1	7 12 9 11	Better management of fishery and monitoring of fish stocks.	Further research on offshore resources, including demersal as well as pelagic stocks, and strict control of levels of exploitation. (Peru)
Development of domestic markets.	Dependence on export markets for much of the industry.			Development of domestic markets and diversification of export fish products.	Nationwide programme of consumer education coupled to fish promotion and institutional feeding. Use of unfamiliar fish species in new products or food dishes. (Peru)
Reduction of dependence on imported vessels and machineries.	Domestic markets not traditionally interested in fish.	9	13	Consumer education and promotion of fish protein foods.	Export of shellfish, slamon and demersal species in addition to canned sardines and fish meal, fish oil products. (Chile)
Upgrading of quality and value of exported fish products.	Energy costs of offshore fisheries a serious economic constraint.a/	26		Development of low fuel consumption vessels and incorporation of energy saving practices and systems in fish plants.	Use of factory ships and low fuel consumption catcher vessels in offshore fisheries. Rationalization of plant capacity and use, phasing out of energy expensive systems. Use of alternative can and packaging materials. (Peru)
Nurturing of the artisanal fisheries sector.	Previous over investment in vessels and fish meal canning plants leaves some of these unused or underutilized.	18		Conversion of ships and factories where possible. Careful monitoring of future investments to avoid over-capitalization of profitable sectors. Investments in port facilities and in cold chain.	Former anchovy seiners converted to tuna fishing or demersal trawling. Fish meal plants re-equipped for canning and freezing. (Peru)
Reduction of packaging and energy costs of processing.	Neglect of small scale fisheries.	26		Special aid to assist artisanal fishermen.	Support for the artisanal fishing sector, with credit, technical assistance, marketing help. (Peru, Ecuador, Panama)

a/ At present applicable essentially to Chile and Panama.

Table 7. Group 7: Laissez faire fisheries
(Area of Hong Kong, Côte d'Ivoire, Malaysia, Philippines, Republic of Korea, Thailand)

Strategies	Special problems	Relevant Constraint	Relevant Enhancement	Approoriate actions	Examples of ongoing actions
Maximize use of existing EEZ marine resources.	Marine resources already well exploited. Only limited possibilities for expansion.	1	11 7	Programmes of conservation and enhancement of marine fishing grounds. Balanced harvesting of all available fish stocks. Aquaculture.	Survey of the marine fish resources of the South China Sea. (Malaysia) Creation of fish sanctuaries, mangrove plantations and artificial reefs.(Philippines)
Develop aquaculture production.	Small scale fish farmers have difficulty gaining local access to land water.		14	Legislative, administrative and financial assistance to fish farmers, possibly incorporated in rural development projects for small scale producers and artisans	Bumiputra fisheries credit and assistance projects. (Malaysia) Rural development banks/Bureau of fisheries assistance programmes for fish farmers. (Philippines)
Maintain supplies to meet domestic demand and to expand export sales.	Domestic demand growing faster than supplies, export species also limited in production.			Control of spoilage and waste, better distribution, introduction of less familiar species in domestic markets.	Fish quality control programmes. Use of solar driers and methods of producing pickled and and fermented fish products. University and college extension services. (Philippines) Import of foreign caught fish for processing in local plants before re-exporting(Thailand)
Continue to encourage assistance and protection to traditional artisanal fishermen.	Distance of fishing grounds and of fishing ports from population centres adds to production costs, especially in fuel and transport.	7 16		Development of fuel economical vessels, insulated and refrigerated vessels and trucks, some vertical integration and efficiency in handling and marketing.	Use of fish carrier vessels to transport fish from the islands to the main navotas fish market. (Philippines) Insulated fish trucks and containers for land transport of fish. (Thailand)
	Growing conflicts between commercial and artisanal fleets on inshore fishing grounds. Small scale fishermen lack credit facilities.	2		Reservation of inshore fishing areas for local artisanal fishermen. Provision of fishery protection vessels. Prosecution of offenders.	Inshore/offshore fisheries management programmes. (Philippines, Malaysia, Côte d'Ivoire)
Reduce fish losses and raise value of fish products.	Spoilage rates average 10% for fresh fish and 95% for cured fish. Some fish is reduced to fish meal for animal feed.		3	Investment in fish landing facilities, markets, ice plants, cold stores, clean water supplies. Manufacture of fish protein concentrate or fish silage.	ADB, World Bank and bilateral aid projects for Visayan island fisheries, providing infrastructure, equipment and vessels. (Philippines) Use of low energy cost systems of fish silage manufacture. (Thailand)

Table 8. Group 8: Lack of industrialization (Mauritania, Somalia)

Strategies	Special problems	Relevant		Appropriate actions	Examples of ongoing actions
		Constraint	Enhancement		
Harvest and process offshore fishery resources, primarily for export.	Lack of capital, inputs and infrastructure and shortage of skilled personnel.	10 13 14 24	1 12 9	Use of joint venture fleets in fish capture and joint venture or foreign investment in fish processing plants.	Construction of two fishing ports with processing plants and ship servicing facilities, on the edge of the desert, financed by local and foreign investment and joint ventures which also supply most of the fishing vessels. (Mauritania)
Encourage artisanal fishing and promote domestic consumption of fish.	Fish not traditional in local diets and no long history of fishing activity.	9	9	Education and training of fishermen and fish curers. Assistance in marketing and distribution. Use of fish protein in nutritional programmes. Programmes for increasing fish in the diet.	World Bank project to exploit offshore fish stocks and develop local capability and infrastructure. (Somalia) Support for local artisanal fishermen and formation of co operatives supplemented by educational programmes at the consumer level. (Somalia)

a/ See tables 3.1. and 3.2 for description.

Table 9. Group 9: Likely exporters
(Maldives, Senegal, Solomon Islands)

Strategies	Special problems	Relevant Constraint	Relevant Enhancement	Appropriate actions	Examples of ongoing actions
Develop export fisheries	High operating costs of fleet (aging and inappropriate fleet).	11 26	1 12 13	Use of joint ventures for offshore and export fish harvesting. Monitor license agreements. Expand and modernize local fleet.	Joint ventures in tuna fishing industry. (Maldives, Solomon Islands) Development of local deep sea fishing fleet. (Senegal, Solomon Islands)
Incorporate local artisanal fishermen as far as possible in fish capture offshore.	Little alternative employment for local fishermen.	24	4	Training of local fishermen and placing them on joint venture ships and plants. Development of local fleet.	Technical assistance and credit for local artisanal fishermen. Raising skills and improving technologies. Diversification of fishing effort, multi-species fisheries. (Senegal)
Invest in local processing capability and infrastructure.	Absence of infrastructure and particularly modern fish processing plants.	16 7	9	Investment in processing facilities with World Bank or foreign assistance. Incroporate climatically appropriate energy systems.	Tuna fish freezing and canning plant project (Solomon Islands) Credit and technical assistance for small fish traders to improve equipment, processes and transport of fish. (Senegal)

Table 10. Group 10: Long distance, state controlled (Cuba, People's Republic of Korea)

Strategies	Special problems	Relevant: Constraint	Relevant: Enhancement	Appropriate actions	Examples of ongoing actions
Maximize production to meet large and growing domestic demand.	Marine EEZ resource fully exploited now. (Cuba)	1	9	Exploitation of non-EEZ waters. Licensed fishing in other EEZ grounds. Development of aquaculture.	Both Cuba and People's Republic of Korea operate to some degree in international waters. Cuba also fishes in other country EEZ's under license or joint venture agreements.
Improve fish quality and distribution.	Inland distribution difficult and fish/ handling/processing inadequate (P.R.Korea)	7		Investment in fish handling, preservation and transport systems. Training of fish workers in quality control.	Cuba has well developed system of fish distribution to every town and village to maximize fish protein consumption amongst rural population.

g/ See tables 3.1 and 3.2 for description.

Table 11. **Group-specific actions**

INVESTMENTS	GROUPS a/									
	1	2	3	4	5	6	7	8	9	10
RESOURCE MANAGEMENT										
- Survey					x			x	x	
- Monitoring		x	x	x		x			x	
- Policing					x	x				
- Aquaculture	x			x	x		x			x
- Conservation						x	x			
- Extension to non-EEZ waters										x
EXTRACTION										
- Ice plants	x				x		x			
- Design and construction of energy economical and appropriate vessels	x	x		x	x	x	x			
- Fish ponds	x									
- Conversion of vessels						x				
- Develop local fleet						x			x	
- Fishing gear			x				x			
- Instrumentation			x			x	x			
PROCESSING										
- Energy economical plants & processes	x			x		x				
- Improved methods of fish curing		x		x			x		x	
- By-catch utilization					x		x			
- Selective rehabilitation		x			x	x				
- Low cost packaging						x				
DISTRIBUTION & MARKETING										
- Cold stores	x		x	x	x					
- Cold chain		x	x	x	x	x	x			
- Improved fish transport systems	x	x	x	x			x		x	x
- Rationalization		x	x				x			
FISHERIES INFRASTRUCTURE										
- Harbours	x	x			x	x	x	x		
- Boatyards	x									
- Marine engineering workshops	x									
- Fish markets	x	x		x			x	x		
- Upgrading					x					
TRADE										
- Domestic promotion			x			x		x	x	
- Export promotion						x			x	

a/ Groups:

1	2	3	4	5	6	7	8	9	10
least favoured	state controlled	low priority	labour intensive	high priority	fluctuating resources	laisser faire	lack of industrialization	likely exporters	long distance state controlled

Table 11. (continued)

SUPPORT ACTIONS AND MECHANISMS	GROUPS a/									
	1	2	3	4	5	6	7	8	9	10
GOVERNMENT POLICIES										
- Integrated development policies	x	x	x	x	x	x	x	x	x	x
- Goals and priorities			x							
- Institutional & legal infrastructure			x	x			x		x	
- Standardization of imported machinery	x									
- Promotion of co-operatives			x	x						
GENERAL INFRASTRUCTURE										
- Roads and transport system	x				x					x
- Water supply	x	x		x						
TRAINING AND EXTENSION										
- Mechanics and technicians	x			x					x	x
- Quality control		x		x	x	x	x	x		x
- Extension services	x			x						
Fishermen										
- Basic	x	x	x	x	x			x	x	x
- Intermediate	x	x	x	x	x			x	x	x
- Advanced	x	x		x	x			x	x	x
RESEARCH & DEVELOPMENT										
- Resource						x				
- Processing					x		x			
- Marketing				x	x					
- Climatically appropriate energy systems	x						x		x	
TECHNOLOGY										
- Fuel/energy conservation systems	x									
- Transfer of intermediate technologies	x			x	x		x		x	
- Transfer of advanced technologies		x	x						x	
CREDIT & FINANCE										
Credit										
- Industrial			x						x	
- Small-scale			x	x	x	x	x			
Monitoring investment										
- Local govt/private		x				x				
- International		x				x				
JOINT VENTURES										
- Fleet		x			x			x	x	
- Processing			x		x			x		
- Marketing		x	x		x				x	

a/ Groups:

1	2	3	4	5	6	7	8	9	10
least favoured	state controlled	low priority	labour intensive	high priority	fluctuating resources	laissez faire	lack of industrialization	likely exporters	long distance state controlled

should aim to introduce and to use fish detection instruments and fisheries charts, and appropriate offshore and deepwater fishing gear. It is important that investment be encouraged for equipping local workshops.

In processing, the greatest need is for investment to improve methods of fish curing. Cured products are usually for the local market and around 25 per cent of dried/cured fish is lost annually through spoilage. The main activity, therefore, should be to reduce losses and improve the quality of cured fish. Consequently, investment should be encouraged in solar fish driers and solar disinfection units as well as in equipment and facilities for sea salt production. Energy efficient plants and processes are seen to be important for groups 1, 4 and 6 and selective rehabilitation for groups 2, 5 and 6. Finally, energy consumption rates are important and an investigation of possibile economies in operation are activities to be encouraged. Such energy economies could be attained through investment in improved insulation, plant upgrading and the installation of more efficient processing units. Investments are also required in the construction of energy efficient buildings and in the use of locally available renewable energy sources. The rehabilitation should not be generalized, but should address the problem of over-capitalization and promote the rationalization of specific industrial processing lines.

Support actions

The support action most widely required is training, which is a generalized need for all groups. The most important need is the training of fishermen, followed by training in quality control.

Credit finance and joint ventures are important mechanisms for the development of the FIS together with specific government policies and research and development. The least number of specific requirements is found in direct transfer of advanced technology. This is probably due to the fact that this activity is implicit in several other mechanisms such as training, research and development, and the use of joint ventures.

The credit requirements are mainly for small scale, the type of credit that is usually scarce in developing countries.

Government policies. The establishment or improvement of institutional and legal infrastructure is an important support action. It is interesting to note that only in group 3 countries have governments generally not already considered fisheries as a priority sector. For all other groups a high to medium government priority has been given and though goals have often been established, integrated development policies usually have not been developed and applied. For this reason, the establishment of such policies appears as an important remedial input for all groups.

Research and development needs for resources are specified only for group 6, where a diversification strategy based on fish resources and markets was found to be most appropriate. However, research on resources is implicit in survey and other management activities. Other research requirements relate to processing, marketing and climatically appropriate energy systems. These are areas where results obtained at a local research institution could easily be transferred to other countries in the group and eventually to other country groups. The possibility of promoting joint co-ordinated research work for countries within a group should also be explored.

Table 11 gives, at a glance, an idea of the multiple actions, for each of the country groups, that have to be taken by the government and by the private sector, promoted by international and bilateral agencies and aid groups and supported by international development banks and other agencies. These actions are priority actions for implementing the suggested group-specific strategies. However, as important as these sets of actions are, great care should be taken not to implement them partially, since they were designed to be applied in an integrated manner.

4.3 Opportunities for co-operation between developing countries

The scope for technical co-operation between developing countries is considerable. Table 12 lists some of the expertise available in developing countries which could be used to promote the development of the fisheries industrial systems within the context of south-south co-operation. Several governments in major fishery regions are already working closely together on resource management and assessment. Technical assistance between countries has taken place mainly through the FAO TCDC programme and through regional associations like ASEAN. Some commercial interchange and co-operation also takes place, particularly in marketing and this has received a substantial boost from the four regional fish market information units, INFOPESCA, INFOFISH, INFOPECHE and INFOSAMAK.

There is considerable expertise in fish culture in Asia and the Far East, in processing and marketing in Latin America, and in specific capture technologies and management regimes in particular countries in each of the continents. To date there has been little direct interregional co-operation except through United Nations agencies and international development bank projects and efforts should be made to promote south-south co-operation utilizing additional mechanisms to the ones mentioned above.

Countries with good experience in offshore capture fisheries are found in groups 2, 4, 6, 7 and 10. These include Morocco, Mexico, Indonesia, Chile, Peru, Republic of Korea, Thailand, Democratic People's Republic of Korea and Cuba. States with well developed artisanal fisheries in groups 4, 5, 7 and 9 include Indonesia, Oman, Philippines and Senegal. Countries with some years of experience of foreign fleets fishing under licence or in joint ventures are Nigeria, Mozambique, Indonesia, Mauritania and Maldives in groups 1, 2, 4, 8 and 9.

High quality artisanal processing skills are found in the Far East, particularly in the Philippines and Thailand (group 7) but also in some countries of West Africa and Central America. Export processing industries are mainly found in group 7 countries (Chile, Ecuador, Peru, etc.) with some in group 2 (Morocco, Mexico, Mozambique).

Important fishing countries with expertise in aquaculture are the People's Republic of China (group 2), Indonesia (group 4), Ecuador (group 6) and the Philippines (group 7). Brazil, Chile and India also have advanced systems for breeding certain species.

Some more specific examples of technology expertise which might be usefully transferred within regions are listed in table 12.

Table 12. Technology expertise available in developing countries applicable to south-south co-operation[a/]

Beach landing craft	Senegal, India
Ocean-going sail craft	South Pacific States, Caribbean
Lake canoes	Zambia, Tanzania
Small purse seiners	Peru, Ecuador, Thailand
Larger trawlers and purse seiners	Thailand, Morocco, Chile
Fish aggregating devices	Samoa, Philippines, Indonesia, Maldives
Long distance fishing	Cuba, Republic of Korea
Fresh fish culture	China, Indonesia
Prawn culture	Ecuador, Indonesia
Fisheries co-operatives	Belize, Indonesia
Dried fish products	Philippines, Thailand, area of Hong Kong
Frozen shrimp	India, Mexico, Brazil, Indonesia, Thailand
Frozen/canned tuna	Indonesia, Philippines, Mexico, Republic of Korea
Canned sardines, mackerel	Morocco, Peru, Ecuador, Chile, Thailand
By-products - fish sauce, shellcraft	Philippines, Thailand
Fisheries management systems	Malaysia, South Pacific states
Foreign fishing agreements	Mauritania, Mozambique, Maldives
Joint ventures	Indonesia, Sierra Leone, Ghana, Morocco
Integrated small-scale fishery projects	Philippines, Indonesia, Benin
Training - artisanal fisheries	Fiji, Papua New Guinea
Training - commercial fisheries	Rep. of Korea, Morocco, Indonesia, Cuba
Training - aquaculture	Indonesia, Philippines
Training - boat building	Rep. of Korea, Tanzania
Training - fish processing	Thailand, Peru
Research vessel operation	Indonesia, Morocco, India
Monitoring fish stocks	Thailand, Kuwait, Peru

a/ The above list is only a general indication of countries with experience and skills in the various areas. A comprehensive listing would be much more extensive but would also need to detail technologies and locations more precisely.

5. SUMMARY OF REQUIRED TECHNICAL ASSISTANCE ACTIVITIES AND INVESTMENT

The identified technical assistance and investment requirements are summarized in table 13. This summary is made according to the components of the fisheries industrial system rather than according to countries or country groups (country-specific actions are presented in the main study).

On the basis of these results country-focussed programmes and projects to promote the development of the industrial activities required to stimulate the full use of the fish resources will be developed. This will require co-ordinated actions with FAO and other international organizations. Similarly, through its investment promotion mechanism - and following its regular procedures - UNIDO will be able to help attract necessary investment resources. At the request of interested countries further detailed studies could be made: first, a quantified and specific assessment of the resources required for obtaining a certain goal for the sector and second pre-feasibility and feasibility studies in order to start-up the actual execution of development projects in the fisheries industrial system.

UNIDO has a range of suitable methodologies and vast experience in their application for developing and executing the necessary support programmes for an integrated sector development. A common philosophy behind these methodologies is that they should be ultimately transferred to the developing countries themselves for use in the actual planning, management and monitoring of the development of the industrial sector under consideration.

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Table 13. **Technical assistance activities and investment requirements**

Components	Activities	Investments	Examples of on-going activities
Resource management			
Surveys and research	Accoustic and biological surveys of biomass and fish stocks.	Research stations and vessels, staff training	Thailand - Resource surveys and stock monitoring. Gulf of Thailand. Kuwait - Fishery Research Station, vessels and ongoing stock monitoring. Somalia - Fridjoff Nansen (research ship) survey of offshore fishing stocks. UNDP/Norway programme.
Monitoring and statistics	Collection and compilation of catch/effort data and length/frequency data.	Fort fishery offices, samples programmes, log book systems.	S. Pacific - Log book system in force for all foreign fishing fleets.
Legislation and policing	Control of fleet size or power. Control of pollution environment. Control of fishing pressure or harvested amount.	Fishery protection vessels and/or aircraft.	Uruguay - Fishery survey with FAO research vessel "La Matra". UNDP Malaysia - New marine seas management regime, trawlers banned from coastal waters state licenses required for local areas, national licensing of commercial vessels. Coastal resources allocated to user groups. Artisanal fishing communities prtected. Resettlement schem ffor trawler fishermen displaced through licensing.
Conservation and enhancement	Control of capture of juvenile fish. Management of coastal zones and inland waters.	Production of larvae for stocking lakes or ponds. Construction of artificial reefs, replanting mangroves.	
Aquaculture	Promotion of fish farming by information, credit and technical assistance. Provision of culture services, fish fry, feed and fertilizers.	Establishment of fish hatcheries and fish farm services	Mexico - Establishemnt of fish hatcheries and fish culture. Indonesia - Extension services for fin fish and prawns. Government, bank and bilateral projects.
International waters	Co-operation with international fishery bodies. Development of economical long distance craft.	Design and construction or modification of vessels for distant water fisheries.	Morocco - Considerable new construction for offshore fleet. Private finance. India - National plans to replace thousands of existing wooden trawlers.
Extraction			
Artisanal fishing vessels	Protection of traditional fishing communities who have no alternative primary source of income. Socio-economic and cultural studies. Integrated projects involving all village activities including fishermen/boatbuilders, net makers, processors, tradesmen and artisans.	Assistance to local boatbuilders to upgrade the strength and efficiency of local craft, to incorporate alternative materials in construction and to manufacture simple pumps and hauling equipment. Community fishery centres, co-operatives, fishery extension services, village water supplies, roads.	Sri Lanka - Several fishing boat building projects. Senegal - Improvements to local beach landing boats - FAO. Somalia - Establishment of local g.v.p. boat factory. Bay of Bengal - Local construction of improved beach landing craft. FAO/SIDA. Indonesia - Fisheries Extension Project, FAO/UNDP. El Salvador - Integrated small scale fisheries project, FAO/UNDP. Benin - Artisanal fishing communities integrated project, FAO/DANIDA. Caribbean - Safety at sea for fishing vessels. FAO/IMO programme. Samoa and Somalia - Improvements to local sailing craft and development of new sail-assisted fishing boats. Bangladesh - Introduction of mechanical and hydraulic haulers on local fishing craft. Indonesia - Training of marine engineers, welders, machinists and operators. FAO/UNDP. W. Africa - Establishment of local service and repair workshops. Local/ international sector. Peru - Rationalization and conversion of fish plants. Development and production of alternative packaging materials. Indonesia - Installation of sea water fish tanks on small local seine vessels fishing for sardine for canneries. Philippines - Bureau of Fisheries extensions and training services, U.S. aid, Fisheries Universities and Institutes, World Bank. Thailand - Fish culture development and extension service.
Commercial fishing vessels	Rationalization of fishing fleets. Development of more energy-efficient craft and safety at sea. Upgrading of technology and skills in local boatyards, shipyards or marine workshops.	Research into fuel efficient engines and hulls, and development of alternative fuel motors. Construction of slipways and repair yards, equipped with marine engineering machinery and tools. Training of ship repair and installation personnel.	
Fishing gear and methods	Introduction and use of F.A.D.s, fish detection instruments and fisheries charts, appropriate offshore and deepwater fishing gear and techniques.		
Vessel machinery and equipment	Introduction, improvement and promotion of blocks and tackles, hoists, derricks, hand winches, mechanical or hydraulic capstans adn winches, windlasses, net drums and polier blocks. Introduction and use of fish graders and conveyors on larger vessels.	Equipping local workshops to manufacture winches, captans, net reels, blocks and derricks. Establishment of marine hydraulic engineering depots. Upgrading training of local technicians.	
Ice supplies and boxes/ containers	Improvement of basic cleanliness and insulation of fish holds, use of ice boxes and fish boxes, refrigerated or chilled sea water tanks, chilled or refrigerated fish holds as appropriate, improved fish handling and processing at sea.	Development and manufacture of locally suitable fish containers. Production and supply of insulation material. Install grading equipment on larger boats fishing for mixed quantities/sizes of species.	
Fish ponds and fish cages	Propagation of information on pond and cage technology, construction, materials, fertilizing, mooring maintenance and repair.	Fish farming extension services. Local language technical literature.	

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Table 13. Technical assistance activities and investment requirements (cont'd)

Components	Activities	Investments	Examples of on-going activities
Processing			
Ice plants and ice stores	Improve the quality and availability of ice. Provide well insulated storage bins or sheds. Develop passive cooling systems to minimize losses.	Small scale economical and efficient ice plants. Simple heat pumps for cooling stores. Insulated stores of local materials.	Indonesia - Rural development project, GTZ, assistance to ice plants, fish handling and marketing. Dominican Republic - Fish salting plant project, UNDP/TCP.
Traditional fish curing	Reduce losses and improve quality of cured fish.	Solar fish driers and solar desinfestation units, Tools and facilities for sea salt production.	Africa - Regional training programmes and courses on fish curing and processing. FAO/DANIDA.
Fish plant quality control	Train plant managers and personnel in quality control and hygiene. Establish standards and inspection services.	Modernize plants with hygienic facilities and equipment necessary for sanitation and cleanliness.	Bangladesh - Shrimp export quality control programme. UNDP. Djibouti - Fish marketing, ice plants and retail outlets project. U.S.aid
Energy-economical plants and processes	Survey energy consumption rates and investigate possibilities of economies in operation.	Improve insulation, energy efficiency by upgrading plants, and install more efficients units. Construct energy efficient buildings and use local renewable sources.	Peru and Venezuela - Research and development of more energy efficient processing equipment and methods. Guyana - Utilization of by-catch from shrimp trawling fleet. Research and development activities.
Low-cost packaging	Investigate substitute canning materials	Local material manufacturing plants.	
By-catch and trash fish utilization	Develop surimi and minced fish products. Initiate by-catch collection/landing schemes.	Construct appropriate local by-catch processing units and modifiy vessles for collection at sea.	
Marketing and distribution			
Fish landing places and market premises	Provide clean water, scrubbers and washing regimes for all fish markets and landing places.	Installation of SWS filters (fresh and/or salt water), pumps and storage tanks. Extend shade cover over fish handling areas.	South China Sea Area - Regional activities to support nationa efforts to improve fish markets and landing places. FAO/UNDP. El Salvador - Integrated fisheries project for small scale sector, improving capture, handling, marketing, boats, geare, water supplies,etc. Philippines - PFMA Navotas fish market project. Brazil - Artisanal fisheries project, Belem, GTZ, ice plants, boxes, transport. Indonesia - Sumatra and Java fisheries development projects, fish handling, distribution and marketing. ADB.
Fish landing and loading systems	Speed up fish landing, sale and loafing on transport in all markets.	Equip vessels with derricks or have them installed on piers, standardize fish boxes/containers. Install weighing machines.	
Transport and packing	Encourage standardization of fish containers and supplies of packing materials.	Manufacture of standard truck size insulated leak proof boxes.	
Cold stores and cold chains	Ensure continuity in frozen fish chains.	Refrigeration equipment, freezers, stores and display cabinest. Refrigerated trucks.	
Fisheries infrastructure			
Harbours, ports and jetties	Provide and improve harbours and landing places for marine fisheries. Survey coastal sites.	Dredging and surveys. Harbour and port construction. Jetties and piers for small scale fisheries.	Indonesia - Fishery infrastrucutre project, ADB and Sumatra fisheries project. New harbours, jetties, markets and facilities. P.D.R. Yemen - New harbour project including fishery harbour and facilities. USSR aid. Training of local marine engineers and refrigeration technicians. FAO/UNDP. Mozambique - Fishery harbour Beira and facilities. FAO and Italian aid. Indonesia and Bangladesh - Various fish transport/collection vessel projects. Barbados - New fish market construction project. ADB.
Boatyards and slipways	Enssure adequate slipping and docking. Facilities for the fishing fleet.	Docking facilities appropriate to fishing vessels and fleet size.	
Marine engineering workshops	Establish repair and maintenance services in all fishing ports, appropriate to needs.	Training of engineers and mechanics. Equipping of workshops in ports and boatyards.	
Access roads	Ensure access to landing places for fish trucks, and establish distribution network.	Communications infrastrucutre, roads, bridges, fish transport vessels.	
Electricity, fuel and water supplies	Provide water, fuel and power to isolated fishing ports where required.	Connection of harbours to national grids, extension of water supplies, installation of generators, pumps and storage tanks where necessary.	
Fish trade			
Domestic markets	Promote local consumption of fish food, develop new products, improve and maintain quality, reduce inefficiencies and bottlenecks.	Fish inspection services, advertising and publicity, institutional feeding programmes, retail outlets, display cases.	Mozambique - Establishment of local quality control and fish inspection services. FAO/UNDP. Latin America - Regional Training courses on frish quality control and processing. FAO/DANIDA. Philippines - Local cottage industry projects. Integrated Service Associations.
Export markets	Raise quality standards to meet importers requirements fish for or cultre exportable species.	Training of plant operators, research and monitoring of processing methods. Credit for suppliers and exporters.	
Non-food products	Encourage shellcraft cottage industries, utilize waste fish or offal for producing meal and oil.	Rural extension and training services, co-operatives, small reduction units.	

SOMMAIRE

Ce document présente les principaux résultats d'une importante étude portant sur le système industriel des pêches dans les pays en développement.

L'étude résumée dans ce document se fonde sur l'analyse de nombreuses données portant sur 64 pays en développement dont onze font l'objet d'une monographie.

L'étude évalue le système industriel des pêches dans 10 groupes de pays ayant chacun leur propre modèle de développement. Pour chacun de ces modèles on met en évidence les options stratégiques, l'investissement et l'assistance techniques requis. Sur les résultats de l'étude il est possible d'élaborer des programmes de développement intégrant l'ensemble du système de l'industrie de la pêche en s'aidant des méthodes habituellement utilisées par l'ONUDI telle que MEPS (Méthode d'Evaluation et de Programmation des Systèmes de Production et de Consommation).

EXTRACTO

Este documento presenta los resultados más importantes derivados de un estudio mayor preparado sobre el desarrollo de estrategias para los sistemas industriales de las industrias pesqueras en países en vías de desarrollo.

El estudio, el cual fué resumido en este documento, está basado en un análisis de una gran cantidad de información sobre 64 países en vías de desarrollo, incluyendo estudios individuales sobre 11 países. Evalúa el sistema pesquero industrial en 10 grupos de países según sus sistemas específicos de desarrollo. Para cada sistema de desarrollo se presentan opciones para formular estrategias y se describen los requerimientos para inversiones y asistencia técnica. Sobre la base de los resultados del estudio se pueden elaborar programas para el desarrollo integral del sistema pesquero industrial utilizando las metodologías standard de la ONUDI, como ser MEPS (Metodología de Evaluación y Programación de Sistemas de Producción y Consumo).

For the guidance of our publications programme in order to assist in our publication activities, we would appreciate your completing the questionnaire below and returning it to UNIDO, Sectoral Studies Branch, Studies and Research Division, D-2073, P.O. Box 300, A-1400 Vienna, Austria

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Q U E S T I O N N A I R E

Industrial development strategies for fishery systems in developing countries: presentation of the main results

	(please check appropriate box) yes	no
(1) Were the data contained in the study useful?	/_/	/_/
(2) Was the analysis sound?	/_/	/_/
(3) Was the information provided new?	/_/	/_/
(4) Did you agree with the conclusion?	/_/	/_/
(5) Did you find the recommendations sound?	/_/	/_/
(6) Were the format and style easy to read?	/_/	/_/
(7) Do you wish to be put on our documents mailing list?	/_/	/_/
If yes, please specify subjects of interest		
(8) Do you wish to receive the latest list of documents prepared by the Sectoral Studies Branch?	/_/	/_/

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